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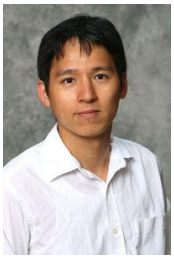

CONSUMER'S WILLINGNESS TO PAY FOR LOCALLY PRODUCED GROUND BEEF: A CASE STUDY

by
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Beef consumption levels are high in the United States, especially in the Midwest. Annual average beef consumption per capita in the Midwest was 73 pounds in 2005, approximately 6-7 pounds more than the national average (USDA 2011). Ground beef has the largest market share (42%) among all identified beef cuts, based on the 1994-1998 Continuing Survey of Food Intakes survey data. Compared to other cuts, ground beef has the highest level of consumption per capita for households among all income levels (USDA 2000). Information gathered from personal interviews with local producers and stakeholders indicates that ground beef is a suitable product for local small and medium-scale producers to establish niche markets, mostly due to its stable supply and strong demand in the region. Besides, both the climate and soil of the northern Great Plains provide a comparative advantage in cattle and bulk commodity production, so agriculture has long been a key contributor to local economic activity in the region.

Previous studies have shown consumers are willing to pay a higher premium for products with "locally-grown" attributes. However, most studies of consumers' Willingness to Pay (WTP) for beef products focus on examining other critical intrinsic attributes, such as fat, taste, nutrition, tenderness. Also, they usually treat "beef" as an overall category and place less emphasis on ground beef in particular. The influences of "being local" on consumption and consumer preference for ground beef has rarely been discussed the literature. Earlier studies either include different cuts or broad product categories such as "beef" or "meat". Moreover, these studies are often based on international, national, or other regional data.

How do rural consumers in South Dakota value the attribute of "locally produced"? Are consumers willing to pay a higher premium for this credence attribute? These are major questions in this study, which targets consumers in a rural South Dakota town. To obtain constructive information for local small- and medium-scaled producers, the product category was narrowed to locally-raised ground beef, in efforts to generate information regarding consumer preferences and WTP. The other major contribution of this study is to capture the closeness between food production and consumption, a unique characteristic of numerous rural towns in this region.

Research Methodology and Data Collection

Based on the random utility theory proposed by Lancaster (1966), this study adopts the Choice-Based Conjoint (CBC) technique to take advantage of conjoint experiment analysis and discrete choice modeling. The CBC method is a multi-attribute decisional method that enables researchers to provide an algebraic description of an individual's preference for a specific good and to mimic consumers' actual purchasing behavior. In addition, with a careful control of the survey design and the experiment procedure, the conjoint experiment method is able to elicit respondents' perceived importance to each attribute by their stated preferences. The conjoint experiment method is an efficient approach to studying people's food choices.

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Three hundred questionnaires were delivered to two different regional retail supermarkets in Brookings, South Dakota. Researchers randomly selected grocery shoppers to participate in the study. We followed Dillman's mail survey technique but adjusted for the nature of busy shoppers and high-traffic at both stores. After verbally explaining the purpose of the study and the survey questionnaire, participants were encouraged to finish the survey at home and return it by mail in a pre-paid envelope. To increase the participation rate, all participants were automatically entered into a drawing to win one of six $100 gift cards.

One of the potential problems of applying the CBC method to estimate consumer preference and WTP is the hypothetical nature of the experiments. Often, respondents tend to overestimate their WTPs. This tendency can possibly damage the implementation of study results. To control for such hypothetical bias, half of the participants (Group 1) were randomly selected to receive a survey with an additional section that explicitly urged participants to answer the questions as if the study results would have actual effects (referred to as the "cheap talk" treatment).

A total of 117 usable surveys were returned, for a response rate of 34.3%. Overall, respondents in Group 1 were slightly older, had higher incomes, were more likely to be married, and spent less on beef than those in Group 2.

Study Results

Relatively Importance of Each Attribute

Conditional Logit analysis was used to investigate consumer preferences for each selected attribute from the original data. Results were then transferred into the comparison of relative importance (R.I.) table (see table 1) to demonstrate how consumers valued each product attribute. Brand difference, price, and leanness are the three most important attributes to determine consumer preferences. Respondents in Group1 (with cheap talk treatment) were considerably more concerned about price and less about brand difference (compared to Group 2). This result suggests that, although they are willing to pay relatively more for locally produced beef, consumers in the Northern Great Plains are price sensitive with regards to beef products. On the other hand, while remaining statistically significant, the relative importance of leanness and grass-fed decreased compared to Group 2 (for participants without cheap talk treatment). Besides, Group 1's relative importance for organic notably decreased, compared to Group 2. This result implied the fact that being organic does not generate price premium.

Willingness to pay (WTP)

An important objective of this study was to estimate consumers' WTP for moving from one level to another within a specific product attribute. If the confidence interval for a given WTP obtains zero inside the range of the interval, this WTP is considered not statistically different from zero and we conclude that consumers are not willing to pay more for one level compared to another. Table 2 summarizes the estimated WTPs and corresponding confidence intervals.

Respondents in both groups have higher WTPs for ground beef produced closer to home. The WTPs for Group 2 to replace Omaha Steaks (i.e., a national brand) with South Dakota Certified (i.e., a state-level brand) and with locally-produced brands are $1.29 /lb and $1.55/lb, respectively. Interestingly, we found a striking drop in values once the hypothetical bias is controlled. However, even for Group 1 (with cheap talk treatment), we still witnessed a $0.33/lb premium for consumers to purchase South Dakota Certified and a $0.71/lb premium for locally-produced ground beef.

The marginal WTPs for consumers to pay for leanness are also notably large for both groups. The price premiums for leanness, after controlling for the hypothetical bias, are $0.59/lb for 80% to 93% leanness and $ 0.37/lb for 85% to 93% leanness . While improving the fat content of beef could be costly, the estimated coefficients indicate that consumers are willing to pay an explicitly higher premium to help offset such extra cost.

Judging by the range of their corresponding confidence intervals, the WTPs for other attributes, including cut difference (between sirloin and chuck), grass-fed, and organic are all insignificant from zero, suggesting that overall, consumers in our sample would not pay higher price for the differences in these three attributes when purchasing ground beef.

Table 1: Summary of Relatively Importance for the Product Attributes

Variables	Group 1 (With "Cheap Talk")		Group 2 (Without "Cheap Talk")	
	Percentage	Standard Error	Percentage	Standard Error
Brand Difference	21.8	2.1***	28.9	3.2***
Price	46.1	2.7***	28.0	3.2***
Leanness	18.2	2.4**	23.5	3.1***
Cut Difference	3.6	2.1*	0.4	2.9
Grass-Fed	8.4	2.1***	9.2	2.7***
Organic	2.0	2.2	10.1	2.7***

Note: * Significant at the 0.1 level ; ** Significant at the 0.05 level; * Significant at the 0.01 level.**

Table 2: Willingness-to-Pay and Confidence Intervals

Changes in Attributes	Group 1 (With "Cheap Talk")		Group 2 (W/O "Cheap Talk")	
	WTP (/lb)	Confidence Interval	WTP (/lb)	Confidence Interval
Omaha Steaks to S.D. Certified	\$0.33	\$0.16-\$0.51	\$ 1.29	\$0.77-\$1.81
Omaha Steaks to Locally-Produced	\$0.71	\$0.51-\$0.91	\$1.55	\$0.98-\$2.12
Leanness (80% to 93%)	\$0.59	\$0.37-\$0.81	\$1.25	\$0.71-\$1.80
Leanness (85% to 93%)	\$0.37	\$0.19-\$0.55	\$0.75	\$0.32-\$1.19
Sirloin to Chuck	\$0.12 $^{\mp}$	-\$0.02-\$0.25	\$0.02 $^{\mp}$	-\$0.27-\$0.32
Grass-Fed	\$0.27 $^{\mp}$	-\$0.06-\$0.61	\$0.49	\$0.18-\$0.80
Organic	\$0.06 $^{\mp}$	-\$0.07-\$0.20	\$0.54	\$0.20-\$0.88

Note: $^{\mp}$: The estimated WTP is insignificant from zero

Conclusions

Among all the attributes considered, the results indicate brand differences and leanness were the two dominant components for determining consumers' preferences. The importance of other attributes including cut difference, grass-fed, and organic were all trivial. Respondents indicated they were willing to pay relatively higher prices for branded and lean beef. The mean WTP's generated by the conditional logit model suggested that consumers' WTP to change from national brand to locally-produced ground beef are \$1.55/lb before controlling the

hypothetical bias and $0.71/lb after controlling the bias.

Producers may be concerned about the marginal benefits and marginal costs in reducing the amount of fat in their beef products. Our results suggest that consumers are willing to pay approximately $0.55/lb to increase leanness for ground beef from 80% to 93%, which indicates that applying techniques for reducing fat content in beef may add value to beef products for local producers. Other product attributes such as cut difference (between sirloin and chuck), grass-fed, and organic do not generate considerable increases in WTP. Because transferring from conventional to organic or grass-fed meat production imposes considerable costs, we suggest local small- and medium-scale producers be cautious about such decisions, since the price premiums can be minimal.

Although limited by the relatively small sample size, this study identifies key product attributes in marketing locally-produced ground beef. The study also shows that finding consumers with close relationships to local food production is important for the successful marketing of local beef. We encourage policy makers and local producers in the Northern Great Plains to utilize the information generated by this study to explore further market opportunities that may help sustain local economies as well as local farm communities.

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